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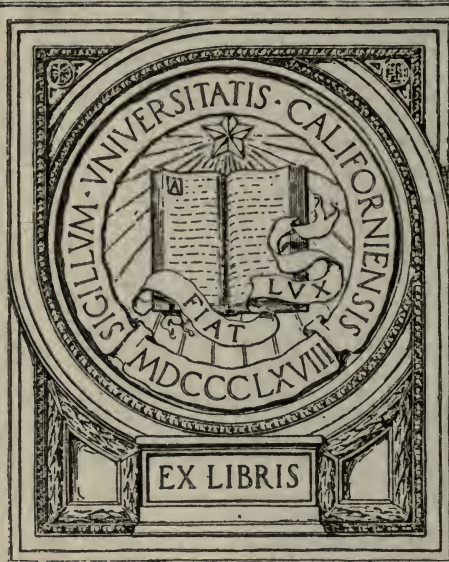
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REPORT
OF
JOINT COMMITTEE ON VALUATION
OF OHIO PUBLIC UTILITIES

UNDER ORDER No. 176 OF THE
PUBLIC UTILITIES COMMISSION
OF OHIO :: NINETEEN FOURTEEN

REPORT
OF
JOINT COMMITTEE ON VALUATION
OF
OHIO PUBLIC UTILITIES
UNDER
ORDER No. 176
OF THE
PUBLIC UTILITIES COMMISSION
OF OHIO

1914

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OF OHIO PUBLIC UTILITIES

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FOREWORD

For some years it has been the custom of the members of each class of utilities in the state to meet together in conventions for the purpose of discussing questions of mutual interest.

In the conventions which followed the issuance of Order No. 176 of The Public Utilities Commission, these associations appointed appraisal committees to supervise the preparation of appraisal forms for use by members of their associations, and to announce principles and instructions to be followed in making appraisals of their properties in response to the Commission's order.

Since many of the questions to be solved are common to all the utilities, it was decided at a meeting of the members of the various appraisal committees, held August 14, 1914, that economy of effort and expense could be secured by the appointment of a Joint Committee to determine upon the principles to be followed in arriving at correct valuations of the various utility properties. At this meeting the undersigned Committee was appointed.

The Committee has made a sincere effort to formulate and to present herein the principles which it believes to be sound and practical as applied to the "reproductive cost new, less depreciation" method of valuing public utilities. The Committee has pro-

ceeded on the assumption that this is the method of valuation called for by the Commission in its Order.

Thanks are due distinguished members of the legal profession, expert accountants, engineers, and men of experience in all of these matters, for their attendance at the numerous meetings and their valuable assistance to the Joint Committee.

Respectfully submitted,

ROBT. LINDSAY, *Chairman*,
Vice President & General Manager,
The Cleveland Electric Illuminating Co.

FRANK C. DUNBAR,
District Attorney,
American Telephone & Telegraph Co.

ALLARD SMITH,
General Manager,
The Cleveland Telephone Co.

ROLLO R. STEVENS,
The Ohio State Telephone Co.

J. C. MARTIN,
President,
Ohio Water Works Association.

F. W. COEN,
Vice President & General Manager,
The Lake Shore Electric Railway Co.

M. B. DALY,
President,
The East Ohio Gas Co.

ANDREW P. MARTIN,
Secretary for Committee.

ORDER NO. 176 AND SUPPLEMENTAL ORDER.

By sections 499-8 to 499-14 of the General Code of Ohio (Laws 1913, pp. 808-812) it is required that the Ohio Public Utilities Commission, "for the purpose of ascertaining the reasonableness and justice of rates and charges for the service rendered by public utilities or railroads of this state, or for any other purpose authorized by law, shall investigate and ascertain the value of the property of every public utility or railroad in the state, used and useful for the service and convenience of the public" and "shall prescribe the details of the inventory of the property of each public utility or railroad in the state."

Acting under the authority conferred by this statute, the Commission, on March 19, 1914, issued its Order No. 176 requiring inventories and appraisals of the property of all public utilities in the state, and on April 25, 1914, issued a supplemental order upon the same subject. Both these orders are printed below. It is intended that the term "Order No. 176," as used throughout this report shall refer to both the original and supplemental orders.

B E F O R E THE PUBLIC UTILITIES COMMISSION OF OHIO

In the matter of the investigation and ascertainment by the commission of the value of the property of public utilities and interurban railroads for the purpose of ascertaining the reasonableness and justice of the rates and charges for service rendered by public utilities and interurban railroads and for other pur- poses authorized by law.	} No. 176
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The commission having under consideration the investigation and ascertainment of the value of the property of public utilities and of interurban railroads of the state of Ohio, for the purpose of ascertaining the reasonableness and justice of the rates

and charges for service rendered by such public utilities and interurban railroads, and for other purposes authorized by law, and it appearing that the value of the property of such public utilities and interurban railroads should be investigated and ascertained, and that rules and regulations prescribing the details of the inventory of the property of each such public utility and interurban railroad are necessary, and it appearing further that public utilities and interurban railroads are required by law to co-operate with and aid the commission in investigating and ascertaining the value of the property of such public utilities and interurban railroads. It is therefore,

ORDERED, That all public utilities and interurban railroads operating, doing business or holding property, except messenger and signalling companies, in the state of Ohio be and they each and all are hereby notified, directed and required to provide and furnish to the commission lists and inventories of all the kinds and classes of property with the value of each kind and class, owned, operated or leased by each such public utility and interurban railroad. It is further,

ORDERED, That the lists, inventories and valuations herein required to be provided and furnished shall be in the form and detail, following:

SECTION A. Land, used and useful by said utility or interurban railroad.

1. Original cost, if any. (State date of acquisition; if unable to state original cost, give reason therefor.)

2. Conditions of said acquisition, (whether by direct purchase, by donation, by exercise of power of eminent domain or otherwise.)

3. Value as of July 1, 1914, of each parcel of land, (give comparisons with the value of neighboring and contiguous parcels of land or of land of similar character as to location and use so far as pos-

sible and authority for whatever comparisons given.)

4. Additional value, if any, for each parcel of land by reason of its present use and basis for such claim.

(N. B. By parcel is meant original or parts of original lots as shown in public surveys.)

SECTION B. Physical property, used or useful by said utility or interurban railroad.

1. Complete list of items going to make up the physical property. (Said lists shall give ample descriptions, maker's name and identification data shall be so classified as to group the items in any proper distribution and shall show the location of all fixed property; provided, however, that the physical property of telephone companies shall be grouped with reference to each Exchange; of electric light and power companies with reference to each power generating plant, as to transmission lines, but distribution lines and all appurtenances connected therewith shall be separately grouped, either in bulk as to whole system or in any geographical division of the territory occupied, that may be desired.)

2. Cost of new reproduction as of July 1, 1914, of each item shown in the list as shown in paragraph No. 1 of this division, together with the unit cost where more than one item of a kind is included in said list.

3. Depreciation, if any, from said new reproductive cost, as provided for in paragraph No. 2 of this section, as of July 1, 1914, showing said depreciation as follows:

- (a) For mechanical deterioration;
- (b) For obsolescence;
- (c) For lack of utility;
- (d) For any other cause;

and for each [a] percentage, together with the total percentage for all causes, and also the total amount of depreciation in terms of dollars.

4. Net value, (being the difference between the cost of new reproduction as shown and the total of all classes of depreciation as shown.)

SECTION C. Any value claimed for any of the following reasons:

(a) Overhead expenses during time of theoretical reconstruction, (stating what expenses are included in the estimate with the percentage for each or a total percentage for all set forth.)

(b) Any value claimed for the possession of a contract to perform the public service together with the basis for said claim.

(c) Any value claimed for "good will," for "going value," for "financing" or for any other reason, together with basis for said claim.

SECTION D. Complete list of all property of whatever kind owned but not used or useful.

SECTION E. The summary of the inventory shall be in the form that shall show the titles of the various classifications and the totals for each classification; showing also the total for reproductive cost, for each class of depreciation, and total net present value. It is further,

ORDERED, That the lists, inventories and valuations herein required shall be filed in duplicate at the office of the commission at Columbus, Ohio, on or before the 1st day of August, 1914. It is further,

ORDERED, That all lists and inventories and valuations herein required of leased property shall be filed with the commission in the name of the lessor. It is further,

ORDERED, That where any public utility or interurban railroad herein required to provide and furnish lists, inventories and valuations, has property in more than one county of the State of Ohio, the value of its property in each of such counties shall be shown. It is further,

ORDERED, That no extension of the time herein limited for the filing of such lists, inventories and valuations shall be taken or granted except upon written application to the commission, which application shall clearly set out the reasons for such extension.

THE PUBLIC UTILITIES COMMISSION OF OHIO,

O. H. HUGHES, Chairman,

C. C. MARSHALL,

E. W. DOTY,

Commissioners.

Dated at Columbus, Ohio, this 19th day of March, 1914.

A true copy:

C. A. RADCLIFFE,

Secretary.

BEFORE THE PUBLIC UTILITIES
COMMISSION OF OHIO

In the matter of the investigation and ascertainment by the Commission of the value of the property of public utilities and interurban railroads for the purpose of ascertaining the reasonableness and justice of the rates and charges for service rendered by public utilities and interurban railroads and for other purposes authorized by law. } No. 176

The Public Utilities Commission of Ohio, desiring to make plain all of the provisions of Order No. 176, recently issued and calling for an appraisal of the property of public utilities of the state, issues the following:

1. It will be observed in the last paragraph of the Order that wherever time beyond August 1st, 1914, is desired for filing inventories with this commission, application for such change together with the reasons therefor must be made. The date set forth in the Order, August 1st, 1914, is purely tenta-

tive. It was manifestly impossible to select a date that would fit all companies. It is the plan of the commission to grant all requests for reasonable extensions of time, provided adequate reasons therefor are given in writing and also stating definitely the extension desired.

2. The commission does not want to be understood as in any way compelling any unnecessary expense in carrying out Order No. 176 on the part of any utility in the state. Ample time will be given to any utility that desires to use its own clerical force to do the work. It is not necessary to employ outside engineers or companies to make this appraisal unless desired by the utility itself.

3. The commission has not, and will not, prescribe blanks for the appraisal of any utility.

The Order sets forth by schedules the information desired and the order in which it is to be returned. The commission desires this information in typewritten form, and on sheets measuring 8½ by 13 inches or very close to that size.

4. The commission desires to emphasize that part of the Order requiring the filing of these schedules and inventories in DUPLICATE. This provision must not be overlooked.

5. All inventories must carry the legal title of the company for which the inventory is made and must be signed in ink by the proper officer or officers.

6. The commission advises that each item called for in the schedule be inserted in the appraisal. If there is no property or value for the item called for, the fact should be so stated.

7. Order No. 176 does not call for maps and charts. The commission suggests that wherever utilities have tracings from which authentic maps or charts may be made, that they be filed with the appraisal. If this is done, these maps must be folded so that they will have as few folds as possible to

produce a sheet 8½ by 13 inches,—in other words, so that the maps and appraisal sheets will be of the same size when the maps are folded. If maps or charts are furnished, they should carry the name of the company, the scale to which the map or chart is drawn, the date of the appraisal, and any proper directions so that the various lines may be understood.

8. The commission desires to be as helpful as possible to the utilities needing assistance or advice. If after a careful reading of the Order or this circular there is anything not understood, do not hesitate to make inquiry.

THE PUBLIC UTILITIES COMMISSION OF OHIO,

O. H. HUGHES, Chairman,

C. C. MARSHALL,

E. W. DOTY,

Commissioners.

Dated at Columbus, Ohio, this 25th day of April,
1914.

C. A. RADCLIFFE,

Secretary.

INTERPRETATION OF THE INTENT AND SCOPE OF ORDER NO. 176.

Although the terms "inventory," "appraisal" and "valuation" are used interchangeably throughout Order No. 176, the evident purpose of the order is to secure not only a complete inventory of the items of property of each utility, but also a valuation or appraisal of this property. It is therefore of the utmost importance that the inventories and appraisals filed under this order should be as accurate as possible, both in the list of the elements of property of the utility, and the costs assigned to these elements. It is important to remember that the property of a utility comprises both its plant, using this word in its largest sense, and its business, and that both must be included in the inventory and appraisal.

The classification set forth in Sections B and C of Order No. 176 and the subdivisions thereof may prove misleading to one who does not consider the matter carefully. The expression "net value" in Section B (4) must not be taken to mean the total value of all the property of the utility. Section B provides only for the valuation of physical property, aside from the overhead costs, and the expression "net value" refers simply to the depreciated value of the physical property without regard to overheads or to the business of the utility. This classification may have been made because of the fact that, generally speaking, the overhead costs, such as engineering, interest during reproduction, etc., do not depreciate with the physical property. Hence, the overhead costs are separately provided for in Section C.

To the cost of the physical property and the overheads must be added the cost of establishing the business and any other elements which enter into the total value of the property of the utility.

USE TO BE MADE OF INVENTORIES AND APPRAISALS.

The use which will be made of the inventories and appraisals filed with the Commission has not been announced. The Commission has the right in the case of any particular company to proceed at once to make a final valuation in accordance with the provisions of Section 499-12 of the General Code, or it may simply retain any inventory and appraisal for such future use as may be desired. If the Commission should in any instance decide to make a final valuation at once, such valuation would under the law thereafter constitute "prima facie evidence relative to the value of the property" as of the date upon which the valuation was made. Even in the absence of a valuation by the Commission, it is possible that an effort might be made to use the inventory and appraisal as evidence against the utility in any proceeding relating to the fixing of rates, capitalization, sale, condemnation, taxation, or any other proceeding which might take place in the future.

PROPERTY USED AND USEFUL.

All property, whether used and useful, or not used and useful, is to be included in the inventory and valuation, and is to be appraised upon the basis of its reproductive cost as of a date certain.

"Used and useful" property embraces the following:

1. Property regularly in service in the course of the utility's operation.
2. Property not regularly in service, but which, owing to the wide range in the demand at different times of the year, is used only at rare intervals, but is actually needed and used at some time.
3. That class of property which of necessity may seldom if ever be used, but which prudence and good management deem essential as a part of the re-

serve capacity of the plant and as a safety measure to guarantee constant service.

4. That class of property which good management and business judgment deem it necessary to acquire in advance of immediate needs, because of the greater economy of present acquirement as compared with acquisition when demands of the public and of the service become urgent, or for other reasons which suggest themselves for the ultimate good of the service. This is also a margin of safety and inures to the ultimate benefit and economy of the service.

5. All other property and property rights devoted to the public use.

The classification of the company's property between that "used and useful" and that "not used and useful" must be based on the operating records and the judgment of the management.

Overhead costs should be applied to all classes of property according to their nature, without regard to whether such property is used and useful, or not.

REPRODUCTIVE COST NEW OF A PUBLIC UTILITY PROPERTY.

The cost of reproducing the property of a utility is made up of:

1. The cost of reproducing the plant.
2. The cost of reproducing the business which was attached at the time of the investigation.

The reproductive cost new of such property (both plant and business) means the cost of reproducing the property as constituted at the time of the investigation. The cost of reproducing the property as of the date certain should take into account all physical, municipal, industrial, and other conditions existing at that time, which affect the cost of

labor, materials, engineering, administration, financing and securing of business, together with all other items which enter into the reproductive cost new of the plant and business as an entirety. Where two or more utilities are operated by a single company, each utility must be valued separately, and the value of any property which is used in common by some or all of the utilities must be apportioned among them in the proportion in which such common property is used by each utility.

The types of units actually in use should be taken, and no theoretical substitution should be made of units of a different type which might be capable of rendering equal service.

The material prices and labor costs to be used should be those on which it would be fair and reasonable to figure in reproducing the property of the utility, making due allowance for market fluctuations and any abnormal conditions. In the case of abnormal conditions affecting market prices, fair prices may be determined by means of a trend curve going back far enough so that the trend price would not be materially affected by going back further. The period for which the trend curve is plotted has no relation to the length of time that would be required to reproduce the property.

PERIOD OF THEORETICAL REPRODUCTION OF PROPERTY, INCLUDING PLANT AND BUSINESS.

In view of the fact that the reproduction of a plant and its business as it exists upon the date of the inventory and appraisal will extend over a considerable period of time, and that construction work will continue to the end of the period, it is obvious that the owner must bear the cost of interest on money expended for reproduction of both plant and business from the time it is raised until such repro-

duction is complete, and also the cost of insurance and taxes over the same period. In order to arrive at the proper amount of interest, insurance and taxes to be added to the other reproductive costs, it is necessary to estimate the reasonable period which such reproduction of the plant and business will require. This period will be different for different utilities and properties of different size, and the Committee cannot undertake to estimate it for all.

Due to lack of appreciation of the many elements to be considered in making this estimate there is a general tendency to assume a much shorter period than is in fact required. The period should begin when the proposition is first conceived and follow through all the successive steps to completion along such lines as obtain today. The date certain to be taken for the completion of the plant and business should be July 1, 1914, as of which the inventory and appraisal are made, and the period of theoretical reproduction should be such period prior thereto as would reasonably be required to complete the plant and business upon said date. It is the opinion of the Committee that although during the earlier part of such period the principal expenditures will be on account of construction, expenditures on account of establishing business will begin at some time during the period and proceed simultaneously with construction expenditures to the end.

OUTLINE OF INVENTORY.

In order to comply with Order No. 176 of the Utilities Commission, it is necessary that the inventory should show the following:

I. Reproduction cost new of:

A. Preliminary Work.

1. Preliminary Investigation. See page 20.

2. Organization of Company. See page 20.

3. Cost of Financing. See page 21.

4. Franchise. See page 21.

B. Physical Plant, consisting of

1. Land. See page 21.

2. Rights-of-way and water rights. See page 23.

3. Buildings. See page 24.

4. Generating or Pumping Plant, Exchange Equipment, etc.

5. Distribution and transmission systems, track, etc.

6. Tools, teams, vehicles, etc.

7. Furniture and fixtures.

8. Working capital. See page 25.

(a) Cash and other quick assets.

(b) Stores and supplies.

9. Other items of physical property.

For unit costs as applied to the above, see page 26.

For overhead costs as applied to the above, see page 28.

C. Established Business.

1. Cost of organizing and training operating, selling and clerical forces.

2. Cost of selling service.

3. Any other costs of attaching business.

For direct costs as applied to the above, see page 33.

For overhead costs as applied to the above, see page 28.

II. Any Other Elements of Going Value or Good Will.

III. All Other Elements of Value.

PRELIMINARY COSTS.

There are necessarily certain costs and expenses which precede the work of actual construction of the plant or development of the business of a utility. Such costs cannot be avoided and must be borne ultimately by the company which becomes the owner of the property. In order to appreciate duly the number and extent of these costs, the person appraising the property should begin with the very inception of the idea, and as far as possible estimate all the necessary costs up to the time of the actual work of construction of the plant.

Some of these necessary preliminary costs are the following:

1. Preliminary Investigation.

This should include all costs from the conception of the idea to the time of organization of the company, such as investigations as to the feasibility of the project, and similar preliminary expenses; not including, however, promoters' compensation, which is classified under "Organization."

2. Organization.

This should include all fees paid to the state for the privilege of incorporation and all fees and other expenditures incident to organizing the utility. It should include the cost of preparing and distributing prospectuses, cash fees paid to promoters, and the actual cash value at the time of organization of securities paid to promoters for their services in organizing the enterprise, cost of preparing and issuing certificates of stock, bonds or other securities.

It should also include legal services required in connection with the drafting of articles of incorporation, by-laws, corporate records of proceedings of directors and stockholders necessary to complete the corporate organization of the company, certificates to the secretary of state, preparing of stock certificates, bond mortgage, and all other documents con-

nected with the issuance of securities, preparing application and securing consent of Public Utilities Commission to the issuance of securities, expenses incident to an increase of the capital stock, and expenses of preparing and filing certificates of amendment to the articles of incorporation. This should not include any discounts upon bonds issued, nor any costs incident to negotiating loans or selling bonds or other evidences of indebtedness.

3. Cost of Financing.

This should include brokers' fees, bankers' commissions, underwriting expenses, cost of soliciting subscriptions for stock, and all other costs in connection with raising funds.

4. Franchise.

This should include only the amount actually paid to any municipality or other political subdivision of state or county for the grant of the franchise.

LAND.

To conform to the requirements of Order No. 176, that part of the inventory and appraisal which treats of the land owned by the utility should set forth the following data:

I. Original Cost.

1. The original cost, including purchase price, or award and expenses of condemnation proceedings; broker's fee; the cost of surveying and expenses in connection with choice of the site; attorneys' fees, and expenses due to any law suit in connection with the establishment of lines; abstract company's fees; recorder's fees and expense of registering title; taxes and assessments accrued to date of transfer of title, and all other liens upon the title, when assumed by the purchaser; payments for damages to abutting property; and cost of grading land when not done in connection with buildings.

2. Date and conditions of acquisition, whether by direct purchase, exercise of power of eminent domain, or otherwise.

II. Value as of July 1st, 1914.

The value as of July 1st, 1914, of each parcel of land. (Give comparisons with value of neighboring and contiguous parcels of land of similar character as to location and use, so far as possible, and authority for whatever comparisons given.)

In determining the value of the land to the utility, the Committee is of the opinion that it is proper to consider all expenses necessary in acquiring the land, including purchase price or award and expenses of condemnation proceedings; broker's fee; the cost of surveying and expenses in connection with choice of the site; attorneys' fees, and expenses due to any law suit in connection with the establishment of lines; abstract company's fees; recorder's fees and expenses of registering title; taxes and assessments accrued to date of transfer of title, and all other liens upon the title, when assumed by the purchaser; payments for damages to abutting property; and cost of grading land when not done in connection with buildings.

III. Additional Value by Reason of Present Use.

If any parcel of land used by the utility is by its location or character especially well fitted to such use, the utility in fixing the value of said parcel should set up under this heading the additional value arising from such special or peculiar adaptability. Thus, for example, in considering the adaptability of a parcel of land for use as a site for a central station, due regard should be given to the following special features which might affect its value:

1. Location with reference to center of distribution.

2. Location with reference to transportation facilities.

3. Suitability of property for future growth.

4. Any other natural advantage, such as availability of supply of condensing water, etc.

RIGHTS-OF-WAY.

This should include the cost of reproducing all rights-of-way acquired for the location of poles, wires, cables, conduits, pipe and track, whether such rights-of-way consist of land owned in fee or of easements acquired by permanent grants or through revocable licenses, oral or written; including the purchase price or award and expenses of condemnation proceedings, the cost of obtaining consents, the salaries and expenses of right-of-way agents and others employed in securing such grants, recorder's fees and all other expenses incurred in the acquisition of such rights.

A discussion of these expenses is more fully set forth under Land, page 21.

WATER RIGHTS.

This should include the cost of reproducing all water rights, whether acquired through purchases of the fee, or through permanent grants or revocable licenses, oral or written; including the purchase price, or award and expenses of condemnation proceedings, the salaries and expenses of persons engaged in securing such grants, recorder's fees and all other expenses incurred in the acquisition of such rights.

A discussion of these expenses is more fully set forth under Land, page 21.

BUILDINGS.

The cost of reproduction of each building owned by the utility should include:

1. Such preliminary costs as the owner must incur for engineering and architectural expenses pertaining directly to the building in question.

2. The contractor's charge for reproducing the building.

This should be based on one or more competent contractors' estimates, taking into account the entire building and all permanent fixtures, such as water, steam and gas piping and fixtures; electric wiring and fixtures for lighting, signalling, etc.; elevators; furnaces, boilers, and other apparatus for heating; and permanent foundations for machinery and apparatus.

The contractor's estimate should show quantities and unit prices and should take into account proper and sufficient allowances for delays due to strikes or other causes, contractor's profit, and his costs for money to meet all payments during the course of construction and until all payments have been made by the owner in accordance with the usual plan of payments.

In making his estimate the contractor should not omit those elements of cost which while not apparent in the finished building are necessarily incurred in connection with its construction. The following list will be suggestive of the type of items referred to:

Demolition of old Buildings	Protection and Underpinning of Adjoining Buildings
General Excavations	Cost of Estimate
Pits and Trenches	Traveling, if any
Pumping and Drains	Fire Insurance
Sheet Piling and Bracing	Liability Insurance
Protection of Street and Repairs	Bond

Fees for Building Permits	Superintendence
Water and Permits	Temporary Office
Protection of Work	Telephone
Stair Guards and Lights	Photographs
Rubbish	Sheds
Foundation Piles	Roadway and Planking
Tests of Steel, Cement and other Material	Temporary Toilets
Protection of Masonry	Temporary Heat
Cutting and Patching	Fence
Waterproofing	Temporary Enclosures
Survey and Levels	Watchmen
	Omissions and Contingencies.

3. Architects' and owners' supervision, extras, changes and unforeseen expenses which are paid by the owner and which are not included in the contractor's estimate.

In this should be included the cost of grading and sidewalks, fences, hedges, etc., on grounds used in connection with the building, and all other items not specifically included in the contractor's estimate.

WORKING CAPITAL.

Working Capital may be defined as the amount of supplies, cash, and other quick assets necessary for the safe, prudent and efficient transaction of a utility's business. It is impossible to lay down any definite rule for estimating the proper amount to be allowed for this item, and this must be determined by each utility with regard to its ordinary outstandings, both payable and receivable, its methods of collections, the natural risk of the business, and the condition of its credit. The allowance should be sufficient to care for emergencies and contingencies as well as the ordinary expenses of operation.

UNIT COSTS.

It is a well-known fact that the plant of a public utility is never constructed as an entirety, or within the theoretical period of construction assumed by the reproductive method of valuation. On the contrary, a considerable portion of every plant is constructed through the gradual addition of extensions and improvements to that portion of the plant which was originally constructed. This experience is ordinarily called Piece-Meal Construction.

Examples of such construction are as follows:

In the case of a telephone plant, extensions of lines and installation of drops, etc.; in the case of an electric light plant, similar extensions of lines for the installation of loops and transformers; in the case of an electric railway, track extensions, connections and switches, built from time to time; and in the case of water and gas plants, the extension of mains and the installation of services.

The cost of construction of a plant by the usual method is of necessity greater than the cost of construction of a plant built as an entirety within the theoretical period of construction.

It is therefore obvious that in the valuation of a plant, due regard must be given this usual method of construction in the determination of unit costs; and these costs will vary somewhat in accordance with surrounding circumstances and conditions. Where practicable, unit costs should be secured from actual day to day performance of the work, and where such data is not available, estimated unit costs should be representative of day to day performance of the work.

The following are the elements which enter into the cost of any unit:

1. Cost of unit f. o. b. point of supply.
2. Cost of purchasing.
3. Cost of inspection.

4. Freight, switching, expressage or cartage to point of delivery, or to utility's store-room or yard.

5. Cost of unloading.

6. Cost of any work at point of delivery, or in shop, store-room or yard, in preparing unit for use.

7. Cost of hauling to point of use, whenever different from point of delivery.

8. Shop, store-room or yard charges.

In the event that the utility owns the yard or the building in which the shop or store-room is located, then the shop, store-room or yard expense for any unit should include a pro rata share of all expenses with the exception of interest, taxes and insurance on such land or building, which items are a part of the overhead charges on land and buildings. But where the utility leases its shop, store-room or yard, a pro rata share of the rental should be included.

9. Labor, including expenses of transportation, board and incidentals, and foreman's time and expenses, in performance of all work at point of use, including lost time and delays in work.

10. Tools and Appliances.

This should include the cost and maintenance of any construction tools and appliances which are lost, stolen or wholly worn out on the work, and the depreciation and maintenance of tools and appliances which are partially worn out on the work.

11. Incidental Material.

This should include the cost of any and all material bought especially for the work, used and consumed in the process of construction.

12. Breakage, Loss and Waste.

13. Construction Superintendence.

By Construction Superintendence is meant such expense as is incurred in the securing of permits and consents, making preliminary surveys of the work, preparing cost estimates, construction engineering, superintendence,

material and labor accounting, issuing work orders, inspection, and all other related expense.

14. Employers' Liability Insurance.

15. Public Liability Insurance.

The foregoing schedule contemplates that the work will be done by the utility's own organization. Where any work is in practice done by a contractor, all items of expense included in the contractor's price should be substituted in place of similar items covered in the above schedule of unit costs.

OVERHEAD COSTS.

There are certain general costs, in addition to the direct or unit costs, which every company must incur in the reproduction of its property, including its plant and business, and for which it must make actual money expenditures. These are commonly termed "Overhead Costs," and are of such a character that they cannot be conveniently apportioned to the units of the property. The costs which should be allocated to the units have been outlined under "Unit Costs," and the overhead expenses, which should be treated as a gross sum or apportioned to large groups of units, are described below. However, no hard and fast line of distinction can be drawn, and each utility must use care in the manner in which these items are treated to avoid duplicating in the gross overheads any items which have been allocated to the units. Apportionments among the groups of units may be advisable where one or more of the overheads apply in varying percentages to the various groups of units; but in such case care must be taken that the apportionments are made correctly.

Experience in making appraisals indicates that the following costs should be treated as overheads:

1. Legal.
2. Administration and Supervision.

3. Engineering.
4. Insurance during Reproduction.
5. Taxes during Reproduction.
6. Interest during Reproduction.
7. Contingencies.
8. Omissions and Oversights.

1. Legal.

This should include the cost of all fees and expenses paid to lawyers, attorneys, or counsel for services or advice required of them during the reproduction period of the property, that have not been included specifically in any other item. Such services would be the following:

Preparation of franchises, contracts, rights-of-way agreements, and all other documents of whatever nature required by the company in the acquisition of its property and rights.

The adjustment of claims for damages and injuries to persons and property.

Attention to injunction and other cases.

General advice from day to day.

Services in connection with corporate meetings.

Services in negotiations for franchises.

All other legal services.

2. Administration and Supervision.

This should include the salaries and expenses of all executive and other officers which are general to the property, and related general expense, such as the salaries and expenses of assistants and clerks, general office rent, and similar expenses necessary in the reproduction of the property, including both plant and business, not already included under Unit Costs or Cost of Reproducing the Business.

3. Engineering.

This should include expenditures for engineering, either the fees paid designing and consulting

engineers, or the salaries, housing and expense of the engineering force required in preparation of specifications and preliminary and working plans for all construction work; making of cost estimates and reports, and the investigation and determination of proper construction practices; checking of contractors' plans, specifications and bids; checking of work for payments on estimates; testing or inspection for acceptance; and advising on work in progress until completed.

The above does not include the construction engineering work done and allocated to the Unit Costs under Construction Superintendence, Item 13 of Unit Costs; or the engineering during preliminary investigations; or commercial engineering, which is included under the Cost of Reproducing the Business.

4. Insurance During Reproduction.

This should include all costs of fire, casualty and any other insurance during the period required to reproduce the property, including plant and business, except such as are included in the Unit Costs.

5. Taxes During Reproduction.

As a part of the reproductive cost of its property a utility should include the cost of all taxes and assessments on property during the reproduction period, except assessments for street, sewer and other improvements which are included as a part of the cost of the land.

6. Interest During Reproduction.

As it is inevitable that the capital invested in the reproduction of the property, including plant and business, must remain unproductive until the plant passes into service, interest on this capital is one of the necessary costs of reproduction. Interest should be computed on the amounts entering into the cost of the property from the time these funds are required until the plant is placed in service.

7. Contingencies.

In spite of due supervision, careful planning and competent management, all difficulties and problems actually encountered in the performance of work can not be entirely foretold and their cost accurately estimated in advance. The character of these contingencies is so varied that it is not possible to anticipate in what form they will arise. Among others there are storms, floods, protracted bad weather, fires, explosions, strikes, riots and civil disturbances. In general practice it is customary to add to all estimates some per cent. allowance under each class of property to cover these contingencies. This should be done in an estimate of the cost of reproduction of the property.

8. Omissions and Oversights.

It is the experience of all appraisers that although reasonable care and thoroughness are exercised, it is not practicable to make an inventory and appraisal of a property without unconsciously omitting things which actually represent expenditures. Therefore a reasonable allowance should be included under this heading to compensate for items of property omitted from the inventory. Generally such allowance is covered by a percentage to be added to each class of property.

APPORTIONMENTS.

Where two or more utilities are operated by a single company, and portions of the plant, transmission lines, distribution systems, or other equipment or property are used in common by some or all of these jointly operated utilities, the value of such jointly used property should be apportioned among the various utilities in proportion to the service requirements made by each utility upon such property.

Where a single company operates two or more utilities, and maintains a stock of supplies for the

benefit of some or all of these utilities, the value of this stock of supplies should be apportioned among the utilities in proportion to the service requirements made upon the total supply by each of the various utilities.

Where utilities are operating in more than one political subdivision, apportionments should be made in proportion to the service requirements of each subdivision or rate area.

APPORTIONMENT OF REPRODUCTIVE COST OF JOINTLY USED POLES.

Joint Ownership.

Where a pole is jointly owned by A and B, the reproductive cost of the pole should be apportioned between A and B on the basis of their respective rights in the pole.

Joint Occupancy.

(a) Permanent Right.

Where a permanent right of occupancy on the pole has been granted by A to B, the reproductive cost of the pole should be apportioned between A and B as though it were jointly owned.

(b) Terminable Right.

Where a pole is owned by A, and B has a right of occupancy on the pole, terminable at the will of A, whether on a rental basis or otherwise, and has certain attachments fastened to said pole, the reproductive cost of A's property should include the entire reproductive cost of the pole and A's attachments; and the reproductive cost of B's property should include the reproductive cost of B's attachments, and also the reproductive cost to B of securing the permits, contracts and rights-of-way, and all other costs involved in reproducing B's rights and physical property.

COST OF REPRODUCING THE BUSINESS.

The reproduction cost of a property embraces not only the physical property, but also all attributes of the property, including its developed earning power.

The cost of reproducing the business should therefore be treated as an element in the value of the property. It cannot be separated from the physical property; for example, if the plant is sold, the sale of the property carries with it the patronage and the power to earn.

The cost of reproducing the business should not go into the unit costs because it is not a part of the units which these costs cover. Moreover, there is no depreciation of this item to be taken into account.

Hence the Cost of Reproducing the Business should include all the necessary costs of attaching the business and reproducing the income of the utility as of July 1st, 1914.

Some of the elements of expense which enter into the Cost of Reproducing the Business are as follows:

1. The cost of organizing and training the operating force, and all employees whose work requires skill peculiar to the business of the utility, such as exchange operators, motormen, conductors, dispatchers, roadmen, signal operators, meter readers, installers, linemen, troublemen, and repairmen.

2. The cost of organizing the clerical force.

3. The cost of organizing and training the selling force.

4. The cost of securing customers, including expenses of solicitors, advertising, printing, free wiring or other inducements.

5. The cost of commercial engineering.

6. The cost of printing all forms, records, books, schedules and directories.

7. The rent of commercial offices (where not owned).

8. Any other cost, not included above, necessary to the development of the business found to exist on the date of the inventory.

DEPRECIATION.

Order No. 176 requires that the appraisal shall show the depreciation, if any, from the new reproductive cost as of July 1st, 1914, of the physical property of the utility.

The term "depreciation" has been variously defined by different writers, depending upon the point from which they view the question, but it is believed that as used in Order No. 176, depreciation may properly be defined as the reduction in value caused by physical deterioration and any present obsolescence or lack of utility, if such exists.

CONSIDERATION OF DIFFERENT METHODS FOR DETERMINING DEPRECIATION.

Several methods have been used by appraisers in determining depreciation. These methods are:

1. Theoretical Methods.
 - (a) The Straight Line Method.
 - (b) The Sinking Fund Method.
2. The Actual Inspection Method.

THEORETICAL METHODS.

Straight Line Method.

The Straight Line Method of estimating depreciation is based upon the assumption that the wearing value of a piece of apparatus decreases uniformly from year to year. Hence the method employed is to determine as nearly as may be the life of the unit, divide 100 by the life in years to arrive at the

annual percentage of depreciation, and multiply this annual percentage by the number of years the unit has been actually in use. The product is taken as the percentage of accrued depreciation of the unit.

Sinking Fund Method.

The Sinking Fund Method assumes that an amount is set aside each year, which, invested at compound interest, will equal the total wearing value at the end of the assumed life. This differs from the Straight Line Method only in that the amount assumed to be set aside annually as an addition to the hypothetical reserve fund is smaller, due to the compounding of the interest. The depreciation at any time is said by the advocates of this method to exactly equal the amount that is or should be in the sinking fund accumulated in this way.

Objections to Straight Line and Sinking Fund Methods.

Both of these methods make use of life tables showing average length of life of similar units. Often these tables do not represent exhaustive studies of any great number of units. Furthermore, unless the life tables are compiled with reference to conditions similar to those surrounding the operation of the unit in question, they are practically worthless as a basis for estimating the length of life of a unit. Frequently such tables are averages taken from records of units operating under widely diverse conditions; hence give no index to the depreciation of a unit working under definite circumstances. Moreover, these tables are based upon studies of units installed many years ago, and operated under conditions prevailing during that period, which are necessarily different from conditions under which similar units are operated today, or will be operated in the future.

Moreover, such life tables are open to objection, because they necessarily fail to accurately measure:

1. The wear and tear which has actually taken place on the unit in question.

Two machines of the same make and age in similar plants may have been called upon to perform widely different degrees of service, resulting in widely different amounts of wear and tear.

2. The standard of maintenance employed.

Widely varying standards of maintenance will be adopted in different plants, and it is impossible to give proper consideration to these variations in the preparation of life tables.

3. The element of inadequacy.

Since a life table is an average and is not made with reference to any given community, it can furnish no guide to any influence which the element of inadequacy from natural causes or from municipal regulation may have upon the date of replacement of the unit.

4. The element of obsolescence.

Any effect which this element may have upon the total depreciation is much more nearly ascertainable by the appraiser at the time of making the valuation in the light of the state of the art at that particular time than by the use of any life tables.

THE ACTUAL INSPECTION METHOD.

The objections which have been urged against estimating depreciation by any of the theoretical methods are met by the use of the actual inspection method. Here the depreciation is determined through actual inspection by an appraiser, and the application of his judgment, verified by such tests as may be practicable. By the inspection method, due allowance is made for the actual wear and tear and the standard of maintenance employed. It is the

consensus of opinion that this method affords the fairest measure of depreciation that can be applied to a property.

Moreover, the statute upon which Order No. 176 is based seems to prescribe the actual inspection method. Section 499-9, Sub-division E, of the General Code, specifically requires that depreciation should be determined from "existing" conditions, using the following language:

"E. Depreciation, if any, from the new reproductive cost as of a date certain for existing mechanical deterioration, for age, for obsolescence, for lack of utility, or for any other cause, the percentage and amount of each class of depreciation, if any, to be specifically set forth in detail."

The law therefore requires a determination of actual existing, as distinguished from theoretical, depreciation. As no actual condition can be ascertained without inspection and observation it seems clear that the statute requires the adoption of the inspection method.

In the use of this method, it is essential that the appraiser must actually inspect not only the unit as a whole, but the component parts of the unit. From his knowledge and experience he must determine the physical condition of the property or unit with reference to the same property or unit new. In making this determination, the age or length of time that such unit has been in service is immaterial.

For example, two similar units may have been installed in different plants at the same time: the first maintained in the best possible condition, or subjected to light service; the second, neglected or carelessly maintained, or heavily overloaded. As a result, the second unit would be found in much lower physical condition than the first. The respective conditions of these units could be arrived at only by inspection.

A further illustration of the advantage and importance of the inspection method in accurately estimating depreciation, is found in the case of water and gas pipes, and underground conduits and cables. Upon examination, it may be found that in one community or district, irrespective of age, the physical condition of the property may be approximately 100 per cent., while in another community or district, due to peculiar local conditions, there may be found a considerable wasting away of materials. The advantage of the inspection method over any theoretical method for accurately appraising the present condition of property is in this case manifest.

The following suggestions are offered as an aid in arriving at the exact amount or percentage to be allowed for depreciation by the use of the inspection method:

Where a unit has deteriorated, but is capable of being restored to approximately 100% condition, through repairs or the replacement of parts, the amount of depreciation will be measured by the cost of the repairs necessary to restore the unit, plus an allowance for any other existing depreciation which cannot be made good by repairs.

For example, a pole which shows rot at the ground line may be reinforced at that point with concrete, and the weakness thereby eliminated. The cost of making these repairs, together with an allowance for any depreciation found to exist in the upper part of the pole, would be the measure of the depreciation.

The cost of restoration is a measure which will be readily applied by the average operator, who is familiar with the expense of repairing units. Or the cost of such repairs may be easily ascertained from the records of the company, or from estimates of competent parties.

In some instances it may be found impracticable to apply this measure, due to the fact that some

units do not lend themselves readily to repair. In such cases, the appraiser must, in the exercise of sound judgment, determine the amount of wear and tear that has accrued, and with reference to the remaining service or wearing value, assign a just amount of depreciation to the unit in question.

The value of almost every unit or piece of property may be divided into two parts: (a) wearing value, and (b) scrap, salvage or other remaining value, such as re-use value.

The scrap or salvage value of a unit is its value or its fair market price as old material, after deducting the cost of removal. The difference between the cost of the unit and its salvage value is the wearing value. Since the salvage value as of a date certain is fixed, and therefore not subject to depreciation, the only part of the value of the unit which may be depreciated is the wearing value.

In the case of certain units the scrap or salvage value might be zero, i.e., the cost of removal might equal or even exceed the fair market price of the old material. In such an instance the wearing value and the reproductive cost new would be equal, and the entire reproductive cost would therefore be subject to depreciation.

An example of a unit which has salvage value is insulated copper wire. The value of the copper itself is the salvage; and the wearing value, which alone is subject to depreciation, is the difference between the salvage value and the cost new of the wire in place.

Where a unit has a value to the utility for re-use at some point in its plant, this re-use value should be taken in preference to the salvage value as the point below which depreciation of the unit does not go. To illustrate: A railroad company may use an 80 lb. rail in its main line until it is so worn that it is no longer useful in that place. But while not safe for use in the main line its value for

use in a branch line or on a siding may be equal to 75% of its reproduction cost.

Another illustration is found in the case of a pole of, say 60 feet, which has been in service and has become decayed at the ground line and therefore unsafe. The pole may be removed, shortened, and reset as a 50 foot pole. As reset, it may have a value of from 40% to 60% of its reproduction cost new.

DEPRECIATION RESERVE.

In order that any reserves which any utility may have set up in the past or may set up in the future may not be confused with the actual depreciation of the property, it is thought best that the Committee express itself clearly on this point.

Depreciation and Depreciation Reserve are two distinct and independent things.

Depreciation has been defined in the foregoing pages.

Depreciation Reserve is a fund set aside in anticipation of the occurrence of depreciation or loss or destruction of any part of the serviceable plant from any cause whatsoever. It is in the nature of an insurance fund to guarantee the continuation of the life of the property and keep it in a condition to render satisfactory service. It is from this depreciation reserve fund that provision must be made to cover replacements made necessary not only by mechanical deterioration, but also by storms, floods, municipal requirements, obsolescence, changes in the art and all other kinds of contingencies which in the nature of things cannot be foreseen.

It is important to note that neither the amount in the depreciation fund nor the amount which ought to be in such fund is in any way a measure of the depreciation or loss of value which has already taken place, nor does it afford a measure of the rate at which depreciation or loss of serviceability will occur in the future.

DEPRECIATION OF PRELIMINARY AND OVERHEAD COSTS.

As used in this discussion overhead costs will not include construction engineering, construction superintendence, and similar expenses which should be allocated to the units as stated in paragraph 13, Unit Costs, page 27. While there may be some exceptions, as a general rule construction engineering and superintendence depreciate with the depreciable part of the units to which they are allocated. But there is no direct connection or relation between the depreciation of any physical units of property and the preliminary and overhead costs which appertain to the property as a going business. For instance, if some poles, sections of rail, cable or conduit depreciate so that they must be replaced, it does not follow that the values resulting from general engineering, legal, financing, organization, and other such costs have deteriorated to the same extent. On the contrary, the per cent. condition of such values may have remained constant, while the per cent. condition of certain physical units may have decreased.

The real test as to whether there is or can be any depreciation of such values will depend upon whether in the replacement of any unit the overhead costs must be reincurred. Subjecting the overhead and preliminary costs to this test, it is found that the costs of preliminary investigation, organization, financing, franchise, legal, administration, general engineering, interest, insurance and taxes during reproduction do not, upon the replacement of any unit, need to be reincurred to any appreciable extent.

Therefore, it is the opinion of the Committee that the depreciation in these values, if any exists at a given time, is so small that it is impracticable to compute it, and that the utilities are justified in ignoring it in making up their inventories.

The depreciation of contingencies and omissions may be estimated to be the same as the average for the entire physical property.

CONCLUSION.

In conclusion, the Committee begs to call the attention of the various utilities to the fact that "Reproductive Cost New Less Depreciation," as called for in Order No. 176, is not the only evidence of the value of a utility; and therefore, in order that no claim of estoppel may be set up in any proceedings involving the value of the property, the following clause should be inserted on the last sheet of the inventory above the signature:

This inventory and appraisal has been made in an effort to comply in all respects with the Commission's Order No. 176, by listing the items of property owned by this company and stating their reproductive cost new less depreciation. The company reserves the right, in any appropriate proceedings involving the value of said property or any part thereof, to offer any other or additional evidence of value.

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